PETROLERA NACIONAL S.A.
Plaza Marbella, Piso 7
Panama
Panama

Saybolt
A CORE LABORATORIES COMPANY

Attention of : Ms. R. Rodriguez
Your reference : Sample Receipt No. 5536

## Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| Report number | : | **13201/00030828.3/L/21** | Submitted date | : | 2021-04-05 |
| Main Object | : | Minera Panama ULSD (TMF) / Testing - April 2021 | Sample submitted at | : | Saybolt Panama |
| Report Date | : | 2021-04-07 | Date received | : | 2021-04-07 |
| Date of issue | : | 2021-04-08 | Date completed | : | 2021-04-07 |
| Sample object | : | TMF(WORK SHOP) | Sample number | : | 11416073 |
| Sample type | : | Submitted | | | |
| Sample submitted as | : | ULSD | | | |
| Marked | : | TMF received sample - for analysis only | | | |

| NAME | | METHOD | UNIT | SPECS | | RESULT |
|---|---|---|---|---|---|---|
| | | | | Min | Max | |
| Gravity API at 60 °F | Q | ASTM D 4052 | °API | 32.0 | | 35.9 |
| Density at 15 °C | Q | ASTM D 4052 | kg/m³ | | | 844.9 |
| Free Water and Particulate Contamination (lab test) | | ASTM D 4176 | | | | |
| Clear and Bright (procedure 1) | | | - | | B&C | B&C |
| Test Temperature | | | °C | | | 26 |
| Color ASTM | Q | ASTM D 1500 | - | | 2.5 | <1.0 |
| Water and Sediment | Q | ASTM D 2709 | vol % | | 0.05 | <0.01 |
| Flash point (PM) procedure A | Q | ASTM D 93 | °C | 60 | | 61.0 |
| Sulphur (S) | Q | ASTM D 5453 | mg/kg | | 15 | 6.8 |
| Ash Content | Q | ASTM D 482 | mass % | | 0.01 | <0.010 |
| Micro Carbon Residue (10% bottom) | Q | ASTM D 4530 / D 86 | mass % | | 0.30 | <0.10 |
| Copper Strip Corrosion (3 hrs / 50 °C) | Q | ASTM D 130 | - | | 2 | 1a |
| Kinematic Viscosity at 40°C | Q | ASTM D 445 | mm²/s | 1.9 | 4.1 | 2.478 |
| Cetane Index | Q | ASTM D 976 | - | 45 | | 46.9 |
| Distillation | Q | ASTM D 86 | | | | |
| 10% Recovered | | | °C | | Report | 201.5 |
| 50% Recovered | | | °C | | Report | 258.4 |
| 90% Recovered | | | °C | 282 | 338 | 316.4 |
| Final boiling point | | | °C | | Report | 345.9 |
| Residue | | | vol % | | 2 | 1.4 |
| Loss | | | vol % | | 2 | 0.1 |
| Lubricity Test at 60 °C (Wear Scar Diameter) * | | ASTM D 6079 | µm | | 520 | 380 |
| Conductivity at 25°C | Q | ASTM D 2624 | pS/m | 25 | | 40 |

All results in this report refer to the sample(s) tested as taken or submitted like specified in this Analysis report. Uncertainties, available on request, apply in the evaluation of the test results. All tests are conducted according to the latest version of the methods, unless another version is specifically indicated. Where available and for convenience purposes, the tested sample has been checked for compliance with supplied specifications, without accepting any liability. In case of dispute or concern, we refer to the interpretation of test results as defined in ASTM D3244, IP 367, ISO 4259 or GOST 33701. This report shall not be partially copied and reproduced without the written permission of the laboratory.

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| NAME | METHOD | UNIT | SPECS | | RESULT |
|---|---|---|---|---|---|
| | | | Min | Max | |
| Biodiesel | ASTM D 7371 | vol % | | 0.1 | <0.10 |

** Analysis results are submitted by a third party laboratory.*

*Lab comments:*
Q: CNA Accreditation LE-002 is applicable for tests followed with a Q

Signed by: Everner Jimenez - Laboratory Manager/Assistant Mgr
Issued by: Core Laboratories Panama, S.A.
Place and date of issue: Panama City - 2021-04-08

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